1. In a method for making a non-porous body of high purity fused silica glass comprising the steps of:

(a) producing a gas stream containing a silicon-containing compound in vapor form capable of being converted through thermal decomposition with oxidation or flame hydrolysis to SiO_2;

(b) passing said gas stream into the flame of a combustion burner to form amorphous particles of fused SiO_2;

(c) depositing said amorphous particles onto a support; and

(d) either essentially simultaneously with said deposition or subsequently thereto consolidating said deposit of amorphous particles into a non-porous body;

the improvement comprising utilizing as said silicon-containing compound in vapor form, a halide-free polymethylsiloxane, whereby no halide-containing vapors are emitted during the making of said non-porous body of high purity fused silica glass.

2. A method according to claim 1 wherein said polymethylsiloxane is hexamethyldisiloxane.

3. A method according to claim 1 wherein said polymethylsiloxane is a polymethylcyclosiloxane.

4. A method according to claim 3 wherein said polymethylcyclosiloxane is selected from the group consisting of octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, hexamethylcyclotrisiloxane, and mixtures thereof.

5. A method according to claim 1 wherein said gas stream is comprised of an inert gas.

6. A method according to claim 5 wherein said inert gas is nitrogen.

7. In a method for making a non-porous body of high purity fused silica glass doped with at least one oxide dopant comprising the steps of:

(a) producing a gas stream containing a silicon-containing compound in vapor form capable of being converted through thermal decomposition with oxidation or flame hydrolysis to SiO_2 and a compound in vapor form capable of being converted through oxidation or flame hydrolysis to at least one member of the group consisting of P_2O_5 and a metal oxide which has a metallic component selected from Group IA, IB, IIA, IIB, IIIA, IIIB, IVA, IVB, VA, and the rare earth series of the Periodic Table;

(b) passing said gas stream into the flame of a combustion burner to form amorphous particles of fused SiO_2 doped with an oxide dopant;

(c) depositing said amorphous particles onto a support; and

(d) either essentially simultaneously with said deposition or subsequently thereto consolidating said deposit of amorphous particles into a non-porous body;

the improvement comprising utilizing as said silicon-containing compound in vapor form a halide-free polymethylsiloxane, whereby no halide-containing vapors from said silicon-containing compound are emitted during the making of said non-porous body of high fused silica glass.

8. A method according to claim 7 wherein said polymethylsiloxane is hexamethyldisiloxane.

9. A method according to claim 7 wherein said polymethylsiloxane is a polymethylcyclosiloxane.

10. A method according to claim 9 wherein said polymethylcyclosiloxane is selected from the group consisting of octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, hexamethylcyclotrisiloxane, and mixtures thereof.

11. A method according to claim 7 wherein said compound in vapor form capable of being converted to at least one member of the group consisting of P_2O_5 and a metal oxide which has a metallic component selected from Group IA, IB, IIA, IIB, IIIA, IIIB, IVA, IVB, VA, and the rare earth series of the Periodic Table is a halide-containing compound.

12. (Amended) [A method according to claim 7] In a method for making a non-porous body of high purity fused silica glass doped with at least one oxide dopant comprising the steps of:

(a) producing a gas stream containing a silicon-containing compound in vapor form capable of being converted through thermal decomposition with oxidation or flame hydrolysis to SiO_2 and a compound in vapor form capable of being converted through oxidation or flame hydrolysis to at least one member of the group consisting of P_2O_5 and a metal oxide which has a metallic component selected from Group IA, IB, IIA, IIB, IIIA, IIIB, IVA, IVB, VA, and the rare earth series of the Periodic Table, wherein said compound in vapor form capable of being converted to at least one member of the group consisting of P_2O_5 and a metal oxide which has a metallic component selected from Group IA, IB, IIA, IIB, IIIA, IIIB, IVA, IVB, V[B]A, and the rare earth series of the Periodic Table is a halide-free compound;

(b) passing said gas stream into the flame of a combustion burner to form amorphous particles of fused SiO_2 doped with an oxide dopant;

(c) depositing said amorphous particles onto a support; and

(d) either essentially simultaneously with said deposition or subsequently thereto consolidating said deposit of amorphous particles into a non-porous body; the improvement comprising utilizing as said silicon-containing compound in vapor form a halide-free polymethylcyclosiloxane, whereby no halide-containing vapors from said silicon-containing compound are emitted during the making of said non-porous body of high purity fused silica glass.

13. (Amended) In a method for making optical waveguide fibers of high purity fused silica through the outside vapor deposition process comprising the steps of:

(a) producing a gas stream containing a silicon-containing compound in vapor form capable of being converted through thermal decomposition with oxidation or flame hydrolysis to SiO_2;

(b) passing said gas stream into the flame of a combustion burner to form amorphous particles of fused SiO_2;

(c) depositing said amorphous particles onto a mandrel;

(d) consolidating said deposit of amorphous particles into a non-porous, transparent glass body; and

(e) [and] drawing optical waveguide fiber from said body;

the improvement comprising utilizing as said silicon-containing compound in vapor form a halide-free [polymethylsiloxane] polymethylcyclosiloxane, whereby no halide-containing vapors are emitted during the making of said optical waveguide fibers.

14. A method according to claim 13 wherein said polymethylsiloxane is hexamethyldisiloxane.

15. A method according to claim 13 wherein said polymethylsiloxane is a polymethylcyclosiloxane.

16. A method according to claim 15 wherein said polymethylcyclosiloxane is selected from the group consisting of octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, hexamethylcyclotrisiloxane, and mixtures thereof.

17. In a method for making optical waveguide fibers of high purity fused silica glass doped with an oxide dopant comprising the steps of:

(a) producing a gas stream containing a silicon-containing compound in vapor form capable of being converted through thermal decomposition with oxidation or flame hydrolysis to SiO_2 and a compound in vapor form capable of being converted through oxidation or flame hydrolysis to at least one member of the group consisting of P_2O_5 and a metal oxide which has a metallic component selected from Group IA, IB, IIA, IIB, IIIA, IIIB, IVA, IVB, VA, and the rare earth series of the Periodic Table;

(b) passing said gas stream into the flame of a combustion burner to form amorphous particles of fused SiO_2 doped with an oxide dopant;

(c) depositing said amorphous particles onto a mandrel;

(d) consolidating said deposit of amorphous particles into a non-porous transparent glass body; and

(e) drawing waveguide fiber from said body;

the improvement comprising utilizing as said silicon-containing compound in vapor form a halide-free polymethylsiloxane, whereby no halide-containing vapors from said silicon-containing compound are emitted during the making of said optical waveguide fibers.

18. A method according to claim 17 wherein said polymethylsiloxane is hexamethyldisiloxane.

19. A method according to claim 17 wherein said polymethylsiloxane is a polymethylcyclosiloxane.

20. A method according to claim 19 wherein said polymethylcyclosiloxane is selected from the group consisting of octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, hexamethylcyclotrisiloxane, and mixtures thereof.

21. A method according to claim 17 wherein said compounding vapor form capable of being converted to at least one member of the group consisting of P_2O_5 and a metal oxide which has a metallic component selected from Group IA, IB, IIA, IIB, IIIA, IIIB, IVA, IVB, VA, and the rare earth series of the Periodic Table is a halide-containing compound.

22. (Amended) [A method according to claim 17] In a method for making optical waveguide fibers of high purity fused silica glass doped with an oxide dopant comprising the steps of:

(a) producing a gas stream containing a silicon-containing compound in vapor form capable of being converted through thermal decomposition with oxidation or flame hydrolysis to SiO_2 and a compound in vapor form capable of being converted through oxidation or flame hydrolysis to at least one member of the group consisting of P_2O_5 and a metal oxide which has a metallic component selected from Group IA, IB, IIA, IIB, IIIA, IIIB, IVA, IVB, VA, and the rare earth series of the Periodic Table;

(b) passing said gas stream into the flame of a combustion burner to form amorphous particles of fused SiO_2 doped with an oxide dopant, wherein said compound in vapor form capable of being converted to at least one member of the group consisting of P_2O_5 and a metal oxide which has a metallic component selected from Group IA, IB, IIA, IIB, IIIA, IIIB, IVA, IVB, VA, and the rare earth series of the Periodic Table is a halide-free compound;

(c) depositing said amorphous particles onto a mandrel;

(d) consolidating said deposit of amorphous particles into a non-porous transparent glass body; and

(e) drawing waveguide fiber from said body; the improvement comprising utilizing as said silicon-containing compound in vapor form a halide-free polymethylcyclosiloxane, whereby no halide-containing vapors from said silicon-containing compound are emitted during the making of said optical waveguide fibers.

23. In a method for making high purity fused silica glass through the outside vapor deposition process comprising the steps of:
(a) producing a gas stream containing a silicon-containing compound in vapor form capable of being converted through thermal decomposition with oxidation or flame hydrolysis to SiO_2;

(b) passing said gas stream into the flame of a combustion burner to form amorphous particles of fused SiO_2;
(c) depositing said amorphous particles onto a mandrel; and
(d) consolidating said deposit of amorphous particles into a non-porous, transparent glass body;
the improvement comprising utilizing as said silicon-containing compound in vapor form a halide-free polymethylsiloxane, whereby no halide-containing vapors from said silicon-containing compound are emitted during the making of said high purity fused silica glass.

24. A method according to claim 23 wherein said polymethylsiloxane is hexamethyldisiloxane.

25. A method according to claim 23 wherein said polymethylsiloxane is a polymethylcyclosiloxane.

26. A method according to claim 25 wherein said polymethylcyclosiloxane is selected from the group consisting of octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, hexamethylcyclotrisiloxane, and mixtures thereof.

27 ~~33.~~ A method according to claim 12, wherein said polymethylcyclosiloxane is selected from the group consisting of octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, hexamethylcyclotrisiloxane, and mixtures thereof.

29 ~~34.~~ A method according to claim 13, wherein said polymethylcyclosiloxane is selected from the group consisting of octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, hexamethylcyclotrisiloxane, and mixtures thereof.

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35. A method according to claim 22, wherein said polymethylcyclosiloxane is selected from the group consisting of octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, hexamethylcyclotrisiloxane, and mixtures thereof.

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36. A method according to claim 12, wherein said polymethylcyclosiloxane is octamethylcyclotetrasiloxane.

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37. A method according to claim 13, wherein said polymethylcyclosiloxane is octamethylcyclotetrasiloxane.

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38. A method according to claim 22, wherein said polymethylcyclosiloxane is octamethylcyclotetrasiloxane.

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39. (Amended) In a method for making a non-porous body of high purity fused silica glass comprising the steps of:

(a) producing a gas stream containing a silicon-containing compound in vapor form capable of being converted through thermal decomposition with oxidation or flame hydrolysis to SiO_2;

(b) passing said gas stream into the flame of a combustion burner to form amorphous particles of fused SiO_2;

(c) depositing said amorphous particles onto a support; and

(d) either essentially simultaneously with said deposition or subsequently thereto consolidating said deposit of amorphous particles into a non-porous body;

the improvement comprising utilizing as said silicon-containing compound in vapor form, a halide-free polymethylcyclosiloxane selected from the group consisting of octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, hexamethylcyclotrisiloxane, and mixtures thereof, whereby no halide-containing vapors are emitted during the making of said non-porous body of high purity fused silica glass.

34 41. A method according to claim 39 (33) wherein said gas stream is comprised of an inert gas.

35 42. A method according to claim 41 (34) wherein said inert gas is nitrogen.

37 43. In a method for making a non-porous body of high purity fused silica glass doped with at least one oxide dopant comprising the steps of:

(a) producing a gas stream containing a silicon-containing compound in vapor form capable of being converted through thermal decomposition with oxidation or flame hydrolysis to SiO_2 and a compound in vapor form capable of being converted through oxidation or flame hydrolysis to at least one member of the group consisting of P_2O_5 and a metal oxide which has a metallic component selected from Group IA, IB, IIA, IIB, IIIA, IIIB, IVA, IVB, VA, and the rare earth series of the Periodic Table;

(b) passing said gas stream into the flame of a combustion burner to form amorphous particles of fused SiO_2 doped with an oxide dopant;

(c) depositing said amorphous particles onto a support; and

(d) either essentially simultaneously with said deposition or subsequently thereto consolidating said deposit of amorphous particles into a non-porous body; the improvement comprising utilizing as said silicon-containing compound in vapor form a halide-free polymethylcyclosiloxane, whereby no halide-containing vapors from said silicon-containing compound are emitted during the making of said non-porous body of high fused silica glass.

38 44. A method according to claim 43 (37) wherein said polymethylcyclosiloxane is selected from the group consisting of octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, hexamethylcyclotrisiloxane, and mixtures thereof.

40 45. (Amended) In a method for making a non-porous body of high purity fused silica glass doped with at least one oxide dopant comprising the steps of:

(a) producing a gas stream containing a silicon-containing compound in vapor form capable of being converted through thermal decomposition with oxidation or flame hydrolysis to SiO_2 and a halide-containing compound in vapor form capable of being converted through oxidation or flame hydrolysis to at least one member of the group consisting of P_2O_5 and a metal oxide which has a metallic component selected from Group IA, IB, IIA, IIB, IIIA, IIIB, IVA, IVB, VA, and the rare earth series of the Periodic Table;

(b) passing said gas stream into the flame of a combustion burner to form amorphous particles of fused SiO_2 doped with an oxide dopant;

(c) depositing said amorphous particles onto a support; and

(d) either essentially simultaneously with said deposition or subsequently thereto consolidating said deposit of amorphous particles into a non-porous body; the improvement comprising utilizing as said silicon-containing compound in vapor form a halide-free polymethylcyclosiloxane, whereby no halide-containing vapors from said silicon-containing compound are emitted during the making of said non-porous body of high fused silica glass.

41 46. In a method for making optical waveguide fibers of high purity fused silica glass doped with an oxide dopant comprising the steps of:

(a) producing a gas stream containing a silicon-containing compound in vapor form capable of being converted through thermal decomposition with oxidation or flame hydrolysis to SiO_2 and a compound in vapor form capable of being converted through oxidation or flame hydrolysis to at least one member of the group consisting of P_2O_5 and a metal oxide which has a metallic component selected from Group IA, IB, IIA, IIB, IIIA, IIIB, IVA, IVB, VA, and the rare earth series of the Periodic Table;

(b) passing said gas stream into the flame of a combustion burner to form amorphous particles of fused SiO_2 doped with an oxide dopant;

(c) depositing said amorphous particles onto a mandrel;

(d) consolidating said deposit of amorphous particles into a non-porous transparent glass body; and

(e) drawing waveguide fiber from said body; the improvement comprising utilizing as said silicon-containing compound in vapor form a halide-free polymethylcyclosiloxane, whereby no halide-containing vapors from said silicon-containing compound are emitted during the making of said optical waveguide fibers.

42 47. A method according to claim 41 46 wherein said polymethylcyclosiloxane is selected from the group consisting of octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, hexamethylcyclotrisiloxane, and mixtures thereof.

43 48. (Amended) In a method for making optical waveguide fibers of high purity fused silica glass doped with an oxide dopant comprising the steps of:

(a) producing a gas stream containing a silicon-containing compound in vapor form capable of being converted through thermal decomposition with oxidation or flame hydrolysis to SiO_2 and a halide containing compound in vapor form capable of being converted through oxidation or flame hydrolysis to at least one member of the group consisting of P_2O_5 and a metal oxide which has a metallic component selected from Group IA, IB, IIA, IIB, IIIA, IIIB, IVA, IVB, VA, and the rare earth series of the Periodic Table;

(b) passing said gas stream into the flame of a combustion burner to form amorphous particles of fused SiO_2 doped with an oxide dopant;

(c) depositing said amorphous particles onto a mandrel;

(d) consolidating said deposit of amorphous particles into a non-porous transparent glass body; and

(e) drawing waveguide fiber from said body; the improvement comprising utilizing as said silicon-containing compound in vapor form a halide-free polymethylcyclosiloxane, whereby no halide-containing vapors from said silicon-containing compound are emitted during the making of said optical waveguide fibers.

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49. (Amended) In a method of making high purity fused silica glass through the outside vapor deposition process comprising the steps of:

(a) producing a gas stream containing a silicon-containing compound in vapor form capable of being converted through thermal decomposition with oxidation or flame hydrolysis of SiO_2;

(b) passing said gas stream into the flame of a combustion burner to form amorphous particles of fused SiO_2;

(c) depositing said amorphous particles onto a mandrel; and

(d) consolidating said deposit of amorphous particles into a non-porous, transparent glass body;

the improvement comprising utilizing as said silicon-containing compound in vapor form a halide-free polymethylcyclosiloxane selected from the group consisting of octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, hexamethylcyclotrisiloxane, and mixtures thereof, whereby no halide-containing vapors from said silicon-containing compound are emitted during the making of said high purity fused silica glass.

45 44
51. A method according to claim 49, wherein said polymethylcyclosiloxane is octamethylcyclotetrasiloxane.

36 33
52. A method according to claim 39, wherein said polymethylcyclosiloxane is octamethylcyclotetrasiloxane.

39 37
53. A method according to claim 43, wherein said polymethylcyclosiloxane is octamethylcyclotetrasiloxane.